Diskussionsschriften

How Feminine is Corporate America?

Gabrielle Wanzenried

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Universität Bern
Volkswirtschaftliches Institut
Gesellschaftstrasse 49
3012 Bern, Switzerland
Tel: 41 (0)31 631 45 06
Web: www.vwi.unibe.ch

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Department of Economics, University of Bern, Gesellschaftsstrasse 49, CH-3012 Bern, Switzerland.
tel +41 31 631 39 23, fax +41 31 631 39 92; email: gabrielle.wanzenried@vwi.unibe.ch;
webpage: http://www.vwi.unibe.ch/staff/wanzenried.html. I would like to thank Sabina Littmann-Wernli, Heather Murray and Kurt Schmidheiny for helpful suggestions and comments. Any errors are entirely mine.

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1. Introduction

How feminine is corporate America? Are there really as few women in executive positions as is often claimed, and how has the situation been changing over the last few years? Do glass ceilings[1] that prevent women from achieving highest positions exist? Do firms with female executives systematically differ from male-dominated corporations? And what about money, do the level and structure of executive compensation differ between men and women? Are different incentive schemes used to motivate women than men?

These and other questions are at the heart of an ongoing discussion about the situation of women in executive positions in companies. Although women are still very rare at the top executive level, there is some evidence that the glass ceiling is finally cracking. As Catalyst, a New York-based research nonprofit research and advisory organization working to advance women in business, reports in its 2002 Census, 15.7% of corporate officers in the Fortune 500 are women, up from 12.5% in 2000. However, there were only 6 female CEOs in the F500 in 2002.[2]

While these issues are commonly discussed in the popular business press,[3] relatively few academic papers systematically investigate them. Bertrand and Hallock (2001), for instance, study the gender compensation gap among high-level executives in US corporations over the period 1992 to 1997, finding that women have nearly tripled their participation in top executive ranks as well as strongly improved their relative compensation.

Hallock (2002) examines the gender wage gap among managers of nonprofit organizations using newly collected data on compensation of managers and accounting characteristics of US nonprofit organizations. He finds significant differences between women and men with respect to both compensation and characteristics of firms they work for.

Bartlett and Miller (1985) investigate the influences of networking and human capital investments by examining a sample of top female executives in the US during the 1980s. They conclude that networking is as important as performance variables in helping women to climb the corporate ladder.

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[1] If glass ceilings existed, they would allow people to see through to the world above them. Because glass is transparent, those working under such a ceiling might not, at first, even notice that there was a barrier separating them from higher levels. Yet if they tried to pass through it, they would quickly learn that the ceiling prevented any such rise. This analogy is often used to describe the situation of women and minorities, who are alledgedly kept from achieving any but token positions at the highest echelons of corporate America. For further information see also http://home.earthlink.net/~rdmadden/webdocs/Shattering_the_Glass_Ceili.html.

[2] For further information see http://www.catalystwomen.org.

[3] See, e.g., The Economist July 16th 1998, Jill-in-a-box; Survey: Women and Work.

The aims of this paper are as follows: First, it provides an up-to-date overview of the distribution of women in top executive positions of US corporations. Second, it attempts to identify significant differences between firms managed by women and those managed by men. Third, it addresses the issue of executive compensation and investigates whether structure and level of executive pay differ significantly between women and men.

To a certain extent the paper complements that of Bertrand and Hallock (2001). It differs, however, in that it uses data up to 2001. Recent data seem particularly important for these kinds of studies given that changes might have occurred over the last few years. In addition, we not only consider the importance of firm size, but also other firm characteristics, e.g., growth, profitability, capital intensity, leverage, which may be related to the distribution of women in top executive positions.[4] As a further new aspect, we look at Chief Executive Officers (CEOs) and all executives separately. This sample split turns out to provide additional insights into some questions. Finally, we provide a detailed analysis of the structure of executive compensation by considering strength of incentive measures with respect to the gender dimension. As far as we know, this has not been done so far.

Our data are taken from the Compustat Executive database, which reports on the top five executives by firm, for the years 1992 to 2001. We have a total of 54'380 observations from 2'489 firms. Our results suggest that there is considerable heterogeneity in the distribution of female executives across industries. Women executives tend to work for smaller, but faster growing and also more profitable firms. Furthermore, women are paid less on average, compared with their male colleagues in executive positions. However, this pay difference is much smaller for CEOs than for executives in general. Finally, we find differences with respect to the structure of compensation in the sense that female CEOs receive more variable compensation and also hold more shares of the firms they are working for.

The paper is structured as follows: Section 2 describes the data. Section 3 discusses the distribution of women in top executive positions across industries and over time. Section 4 investigates whether the existence of female executives in a company is related to firm-specific characteristics. The question of compensation differences between male and female executives in terms of level and structure is explored in section 5. Section 6 draws conclusions.

[4] As Bartlett and Miller (1985) note, the executive compensation literature tends to focus on firm size and profitability rather than other company characteristics.

2. Data

Our main data source is the Compustat Executive Compensation database. We have compensation data from the top five executives for each firm for the years 1992 to 2001. The data on executives contain various firm- and person-specific information. For certain analyses we split the sample into Chief Executive Officers (CEOs) and All Executives since there are significant differences between these executive categories especially with respect to role of women. The sample contains all firms in the Compustat database. We retain those observations for which the gender of the executives is known and where we have non-missing information on the main compensation measures as defined in section 5. Overall, we have a total of 54'380 observations from 2'489 firms. We combine the data on executive compensation with financial statement information taken from the Compustat Industrial Annual database. All the data are reported in thousands of 2001 dollars adjusted using the consumer price index.

3. How widespread are female executives?

A first look at the data shows that female executives form a clear minority. Table 1 shows the absolute and relative number of women in top executive positions. On average, there are 3.77% female executives in our sample, and the proportion of female CEOs is as low as 1.16%.

[Insert Table 1 about here]

From Figure 1, which shows the percentage of female executives over the years, we see a clear positive trend.[5] However, this mainly holds for the category All executives, whose share increased from 1.92 % in 1992 to 6.5 % in 2001, and much less for CEOs, for which the share of women increased from 0.62 % in 1992 to 1.58 % 2001. As we will see later on, larger firms are less likely to employ women as top executives. Given that our sample comprises only listed firms, which are also larger on average, it is obvious that this as well as the other findings are not representative for all US corporations.

[Insert Figure 1 about here]

Let us finally look at the distribution of female executives across industries, shown in Table 2. There is a considerable heterogeneity across industries. Female executives are most widespread in the Wholesale and Retail Trade and Information industries, but also in Food, Tobacco and Textile Manufacturing as well in Health Care and Social Assistance. If we focus on

[5] From regressing the share of female executive against time we obtain a highly significant, positive time trend for all both categories.

CEOs only, the proportion of women is much smaller or zero for certain industries. Even though there are some women in executive positions, the CEO jobs are still very much a man's domain. Note that these figures might be affected by company size, which is related to industry affiliation as well as to the share of women executives. We will investigate the role of firm size and its potential interaction with other characteristics in more detail in the following section.

[Insert Table 2 about here]

4. Which firms are managed by women?

The previous section gives us a preliminary picture of the distribution of female executives over time and across industries. To go one step further, we now ask whether firms with female executives have specific characteristics, beside those associated with industry classification. Since economic theory does not really guide us in our choice of company characteristics, we mainly rely on existing studies on gender issues as well as on our intuition. This results in a somewhat heuristic exercise, which, however, may still reveal some interesting facts.

The following firm-specific characteristics are considered: (1) Size of firm: According to Bertrand and Hallock (2001), women tend to work for smaller firms. We use the number of employees (*empl*), sales (*sales*) and the market value of the firm (*mktval*) to measure the size of the firm.[6] (2) Physical capital intensity: We use the ratios of fixed assets per employee[7] (*fix_empl)* as well as fixed assets over total assets (*fix)*. (3) Uniqueness: We measure the uniqueness of the firm by the ratio of research and development expenses, and advertisement expenditures respectively, over total assets. (4) Profitability: We use EBIT over total assets as well as the return on assets to arrive at an indicator for firm profitability. (5) Growth: According to Carter et al. (2002), growth is a strategic choice variable, which may, among others, also depend on the executives' preferences. We measure growth by the q-ratio (*q)*, which is similar to Tobin's q,[8] and the change in total assets from year *(t-1)* to year *t (chg_assets)*. (6) Risk exposure: There is a stereotypical view that women avoid risky situations more than men.[9] We

[6] Bertrand and Hallock (2001), who also use total assets as a fourth measure for firm size, find that women tend to work for smaller firms

[7] Rajan and Wulf (2003) use this variable to measure the importance of human capital in a firm.

[8] The q-ratio is defined as total assets plus the difference between market value and book value of equity over total assets. It is commonly used to measure a firm's growth opportunities.

[9] See, e.g., Powell, Schubert and Gysler (2001) for further references.

use the ratio of long-term debt over total assets (*debtr_lgt)* and the volatility of stock returns[10] *(volat)* to measure the firm's risk exposure.

In a first step, we check whether the mean of these characteristics differs between women and men in executive positions. Besides considering all executives, we also look at the subsample with the CEOs only. This is simply a descriptive exercise and does not control for any industry or time effects or potential interactions between the characteristics which may drive certain relationships. Also, we say nothing about the direction of causality. Table 3 reports our findings.

[Insert Table 3 about here]

As we can see from Table 3, firms with female CEOs are on average smaller than those with a man in the top position. When looking at all executives, this relationship only holds when the size of the firm is measured by sales and by market value. As to the physical capital intensity, we find that men tend to work for more capital-intensive companies. This may to a certain extent reflect the distribution of women across industries, since the most capital-intensive industries such as Mining, Oil, Construction and Utilities have a low proportion of female executives. From our uniqueness measures we see that R&D intensive firms are more likely to have a man as CEO. Advertising intensive firms, on the other hand, do not significantly differ with respect to the gender of the CEO, but women are underrepresented among the top five executives.

Women executives are at the head of more profitable firms on average, where profitability is measured as EBIT over total assets. This finding, however, is not confirmed when we look at the return on equity, for which we find no significant difference. As to growth of firms, we find no significant differences when looking at the CEOs only, and the findings are inconclusive when all executives are considered. Finally, firms with a woman as CEO are, on average, less leveraged, but do have a higher volatility of stock returns. These relationships are reversed when we consider the top five executives. These characteristics may again be related to the firm size, for which we found significant differences between men and women. We know from capital structure studies, for instance, that larger firms are more leveraged.[11]

Overall, we find robust results with respect to gender of executives and firm characteristics for firm size, physical capital intensity, profitability as measured by EBIT over total assets, and

[10] The volatility of stock returns is measured as the standard deviation of returns over the last 60 months as used in the Black Scholes formula to calculate the value of an option.
[11] See, e.g., Tittman and Wessels (1988).

leverage. Also, findings vary depending on whether we only look at the CEOs or whether we consider all executives together.

To have a more complete picture of which firms are run by female executives and to take account of possible interactions between the characteristics, we estimate a logit model where we explain the likelihood that a company is managed by a woman by the firm characteristics considered above. A firm is considered as 'woman managed' if there is at least one woman among the top five executives. Accordingly, the dependent variable is the binary variable *1+fem_exe,* which is equal to one if there is at least one woman among the five top executives in a given year, and zero otherwise, i.e.,

$$P(Y_i = 1|X) = P_i = G(\alpha + \beta_1 size_i + \beta_2 fix_i + \beta_3 uniq_i + \beta_4 profit_i + \beta_5 q_i + \beta_6 risk_i) \quad (1)$$
$$i = 1,..,N$$

We estimate different specifications with respect to the included explanatory variables to allow for the fact that alternative measures for company characteristics do not always measure the same feature. Also, we include industry dummies, with the chemical (and other material) manufacturing industries as a benchmark case, and year dummies as control variables. Robust standard errors are calculated according to the Huber/White/Sandwich estimator of variance and are given in brackets. Table 4 provides the results.

[Insert Table 4 about here]

Given the results from the logit regressions in Table 4, we observe that smaller and faster growing[12] firms are more likely to have female executives.[13] To get some idea of the strength of these relationships, let us consider the average firm in the sample, with a market value of 4'784 Mio. From the first specification it follows that the log odds is -3.32. The corresponding probability of having at least one female executive amounts to 3.49%.[14] Let us now look at a firm which is fifty times larger but otherwise identical. The log odds ratio with the higher market value is now –4.14, which yields a probability of having female executives of 1.56%. Such an increase in size thus makes it more than half as likely that the firm is managed by women.

Furthermore, advertising and R&D-intensive companies, which are considered to be more unique, are less likely to have female executives, even though we only find significant results for

[12] We only report the results with the *q* ratio as growth proxy. The results from the change in total assets *chg_assets* are similar.
[13] The correlation between *mktval* and *q* is 0.13.
[14] The log odds of –3-32 is obtained by multiplying the estimated coefficients by the mean values of the variables. The probability of having female executives is then $\frac{1}{1+(\exp(-3.32)} = 0.0349$.

the first measure. More profitable firms are more likely to have women among their top five executives.[15] Finally, both our risk exposure measures *debtr_lgt* and *bs_volat* do not lead to conclusive results.

These results to a certain extent confirm the descriptive statistics as outlined in Table 3, even though they also depend on the model specification. Furthermore, the coefficients of the time dummies from 1993 on are significant at the 1% level in all the specifications. This reflects the fact that women did indeed become more numerous in top executive positions over the time period considered. Overall, we conclude that our explanatory variables do not explain much of the variation in the dependent variable, which indicates that more research is needed to achieve better understanding of what determines female leadership in large corporations.

5. Compensation issues

5.1. The level of compensation

Do women in top executive positions earn less than their male colleagues, as is the case in many other professions? Following Bertrand and Hallock (2001), we look at total pay figures of executives (*pay_tot)*, which consist of the following four components: (1) salary (*salary*) is the dollar value of cash and non-cash salary; (2) bonus (*bonus*) is the dollar value of cash and non-cash bonus; (3) options (*option*) refers to the dollar value of options granted in the current period as valued using S&P's Black Scholes methodology; and (4) other (*other*) consists of the dollar value of annual compensation not categorized as salary or bonus. Figures 2.1. and 2.2. show the evolution of total pay over the years for CEOs as well as for all executives.[16]

[Insert Figure 2.1. about here]

[Insert Figure 2.2. about here]

From Figures 2.1. and 2.2. it appears that the average total pay is not always higher for men than for women when we look at the CEOs alone, but it is the case in all the years when we consider all executives together. To have a more precise picture of these data, we check whether the mean of total pay as well as its components differ significantly between women and men. The statistics are given in Table 5.

[Insert Table 5 about here]

As we can see from Table 5, there is indeed no significant difference in total pay between women and men in CEO positions. The only difference is with respect to bonus payments, which

[15] The correlation between *mktval* and *adv_int* is –0.006 and between *mktval* and *profit_ta* is 0.05.
[16] Bertrand and Hallock (2001) only consider all executives together and do not look at the CEOs separately.

are significantly higher for men. When we look at all executives, however, we find that women are indeed paid less than men, and this holds for all compensation components. On average, women executives earn 26% less than men.

To take into account potential effects from firm size, industry affiliation, profitability and the age of the executive,[17] we run the following regression:

$$\log(pay\_tot_i) = \alpha + \beta_1 fem_i + \beta_2 age_i + \beta_3 mktval_i + \beta_4 roe_i + \varepsilon_i \qquad (2)$$
$$i = 1,..,N$$

where *fem* is a dummy variable equal to one if the executive is a woman and zero otherwise, *age* stands for the age of the executive, *mktval* is the market value of equity and *roe* refers to the return on equity, and ε is the error term with $\varepsilon \sim N(0, \sigma^2)$. We also include time and industry dummies, with the chemical (and other material) manufacturing industry as the benchmark case. Table 6 shows the results of our OLS regressions, for CEOs as well as for all executives.

[Insert Table 6 about here]

As we can see from Table 6, total pay is significantly lower for women than for men, both for all executives and for CEOs, and after controlling for age of executive, firm size and profitability. Interestingly, the negative effect is much smaller for CEOs. While a female executive earns, on average, 44% less than her male colleagues, this difference shrinks to 22% when CEOs are considered alone. Consequently, the gender compensation gap is less accentuated for executives in CEO positions.[18]

Besides these gender issues, our results also show that the older executives earn more, which is a well-documented fact from human capital theory. However, age, which is also considered as a proxy for work experience, seems to be less reflected in a higher wage for CEOs than for all executives. On average, a CEO is 56.23 years old, whereas female CEOs are 49.93 and male CEOs are 56.3 years old on average. For all executives, the average age is 54.88 years, with 49.14 years for women and 55.04 years for men. Finally, our results show that CEO pay depends on firm performance, although we do not find significant results for all executives.

[17] According to Bartlett and Miller (1985), executive pay, is, among other factors, a function of firm size and profitability. The inclusion of human capital variables goes back to the theory of human capital by Gary Becker . Due to unreliable or missing data with respect to tenure and education, we only include the executive's age as a proxy for human capital.

[18] Unfortunately, we do not have reliable data on education and tenure of executives. The inclusion of such information is expected to further reduce the wage difference between women and men Bertrand and Hallock (2001) additionally control for education and tenure and find that the unexplained gender gap for all executives is reduced from 45% to less than 5%.

5.2. The structure of compensation

Besides the absolute level of compensation, we are also interested in whether the structure of compensation, and more specifically the strength of the incentives offered, differs by gender. Compensation contracts are typically negotiated between executives and companies and therefore reflect, among others factors, the preferences of executives.[19]

We consider the following strength of incentive measures:[20] (1) the proportion of compensation that is variable (*varpay),* (2) the percentage of options (*optsh)* relative to total compensation, and (3) the proportion of company stock owned by the executive (*shrownpc)*. While the first two measures can be computed for CEOs as well as for all executives, data on shareownership is available for CEOs only.

Figures 3.1. and 3.2. show the variable compensation component, which is defined as *(pay_tot-salary)/pay_tot* and expressed in %, over the years considered. The higher the variable pay component, the stronger the incentives for executives. From Figure 3.1. we observe that women CEOs have higher variable pay in the majority of years. We also obtain a significant result from a two-sided means difference test. When all executives are considered, we may have the impression that men's compensation is more variable. The difference over the whole period, however, is not significant.[21] Besides gender considerations, these figures also nicely illustrate that the proportion of variable compensation increased over the years.[22]

[Insert Figure 3.1. about here]

[Insert Figure 3.2. about here]

Stock options are typically awarded to align the executives' incentives with those of the shareholders in order to reduce the agency conflict.[23] They also provide incentives against short-termism among managers. The higher the option share relative to total compensation, the more executives are expected to act in the interests of shareholders, and the higher is the strength of their incentives. The variable *optsh* is defined as *(option/pay_tot)* and again expressed in %.

We cannot conclude from Figure 4.1. that there is a systematic difference in option awards between female and male CEOs, and means-difference tests confirm the absence of a significant

[19] See Murphy (1999) for an overview of compensation practices.
[20] See, e.g. Kedia (1998).
[21] These findings are confirmed when regressing the variable pay component *varpay* against a constant, the dummy variable *fem, mktval* as a proxy for size and year dummies: The coefficient of *fem* is significant at the 5% level when looking at CEOs only, and not significant for all executives.
[22] Regressing *varpay* against time and a constant results in a highly significant time trend.
[23] See, e.g. Haugen and Senbet (1981).

difference. When considering all executives, we find that women obtain significantly higher options over the whole period. It is, however, likely that this result is driven by the higher distribution of options as well as female executives over recent years. To confirm this, we run a simple OLS regression where we explain *optsh* by a constant, the dummy variable *fem,* and *mktval* as proxy for firm size. The coefficient of *fem* is significant at the 1% level for all executives, but insignificant for the CEOs. Once we include time dummies, however, there is no significant gender effect anymore. Apart from these considerations, Figures 4.1. and 4.2. provide further evidence for the more frequent use of options for compensating executives.[24]

[Insert Figure 4.1. about here]

[Insert Figure 4.2. about here]

Let us now look at our third strength of incentive measure, the shareownership of CEOs *shrownpc.* As we can see from Figure 5, at the beginning of the time period under consideration male CEOs seem to own a larger portion of the company they are working for compared with their female colleagues. This pattern does not persist over the years, and it even seems to be reversed in most recent years. From a two-sided means difference test over all the years we would conclude that female CEOs own more shares than men do.

[Insert Figure 5 about here]

However, it is again difficult to draw any conclusions without taking into account other factors that may possibly affect executives' shareownership. As Demsetz and Lehn (1985) outline, ownership concentration is related to firm size. When a firm grows, managers are likely to have a lower share due to wealth constraints and efficient risk bearing. A second factor which has to be considered is the control potential of the firm, i.e., the profit potential which arises from effective monitoring of executives' performance (Demsetz and Lehn 1985). The higher the uncertainty of the environment, the greater the gains to managerial ownership. Given that female leadership is correlated with these firm characteristics in our sample, it is even more important to take these factors into account. To do so, we run the following regression:

$$\begin{aligned} &shrownpc_i = \alpha + \beta_1 fem_i + \beta_2 mktval_i + \beta_3 bs\_volat_i + \varepsilon_i \\ &i = 1,..,N \end{aligned} \qquad (3)$$

Besides the dummy variable *fem*, which is one if the CEO is a woman and zero otherwise, we include *mktval* as a measure of firm size and *bs_volat* to proxy for uncertainty of the firm environment in our regression. ε is the error term, with $\varepsilon \sim N(0, \sigma^2)$, and we again include time

[24] See, e.g., Murphy (1999) and Conyon and Murphy (2002) for further evidence.

and industry dummies to control for any changes over time and across industries. Table 7 shows the results of our OLS regressions.

[Insert Table 7 about here]

Table 7 confirms our previous finding that women CEOs own, on average, a higher portion of the company they are working for than men in the role of CEO. This relationship is not driven by firm size since the coefficient of *fem* is still significant at the 5% after including *mktval* in the regression. The coefficient of *bs_volat* is not significant, even though we would expect a positive sign.

We also computed the pay-performance sensitivity according to Jensen and Murphy (1990), where the change in compensation from year (*t-1)* to *t* is regressed on the change in shareholder wealth over the same period. To see a potential gender effect, we also included an interaction term as a multiplication of the change in shareholder wealth with the dummy variable *fem.* We found no systematic difference between women and men in the CEO position, i.e., the significance of the lower pay-performance sensitivity for women CEOs disappeared once we included the firm size as a control variable.[25]

6. Conclusions

This study attempts to give an overview of the distribution of women among top executives in US corporations. Besides considering the share of women executives across industries, it tries to identify firm characteristics that are correlated with a higher share of women among top executives. Even though female executives, and more specifically female CEOs, are still very rare, our data show a clear positive trend over the time period considered.

Our analyses concerning the level and structure of executive compensation reveal that women earn less than men. While this observation holds for all executives as well as for CEOs, the wage difference is much smaller for the latter subsample. On the other hand, female CEOs seem to encounter stronger incentives than their male colleagues. Not only does their compensation contain a higher variable share, but they also own a larger portion of the firm they are working for, which links their wealth more closely to the performance of the company.

Further work is needed to obtain a better understanding of the mechanisms behind the distribution of female executives. It would be interesting to look not only at firms listed on stock markets, but also at smaller firms, where women are thought to play a more important role. It

[25] According to Baker and Hall (1998), the pay-performance sensitivity is a function of firm size.

may als be fruitful to consider more information about the human capital of executives. In addition, it would be interesting to see whether the internal organization of firms is related to the proportion of female executives. Some of these aspects will be addressed in future work.

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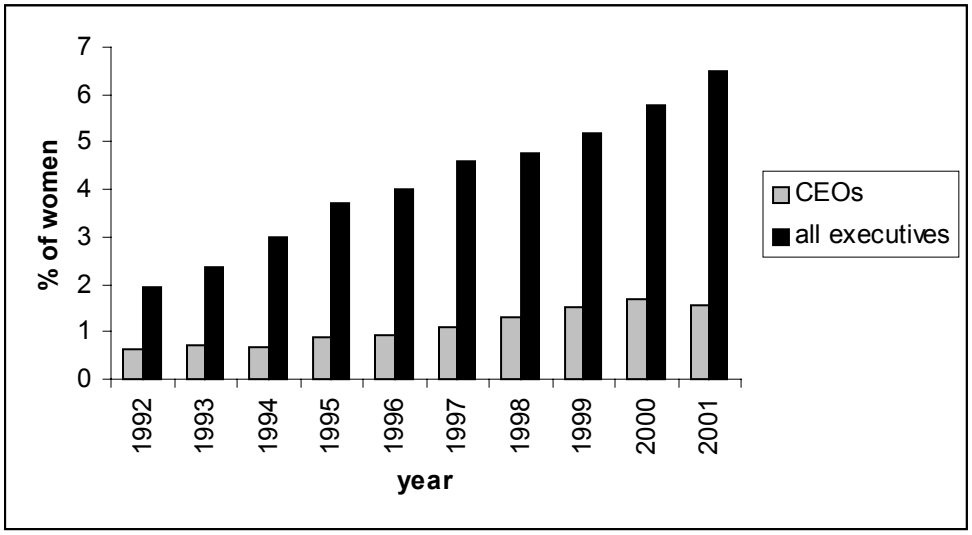
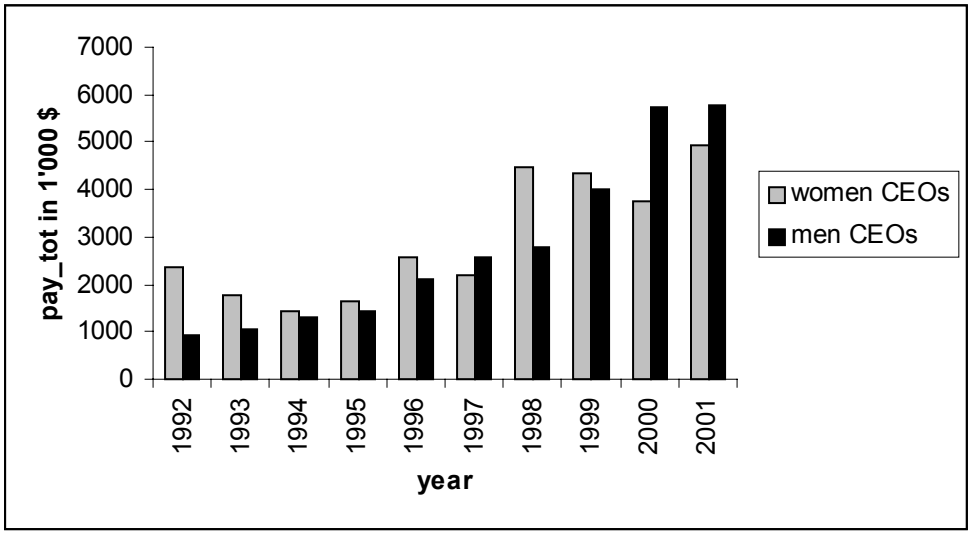
Figures

Figure 1: The dissemination of female executives by category over time



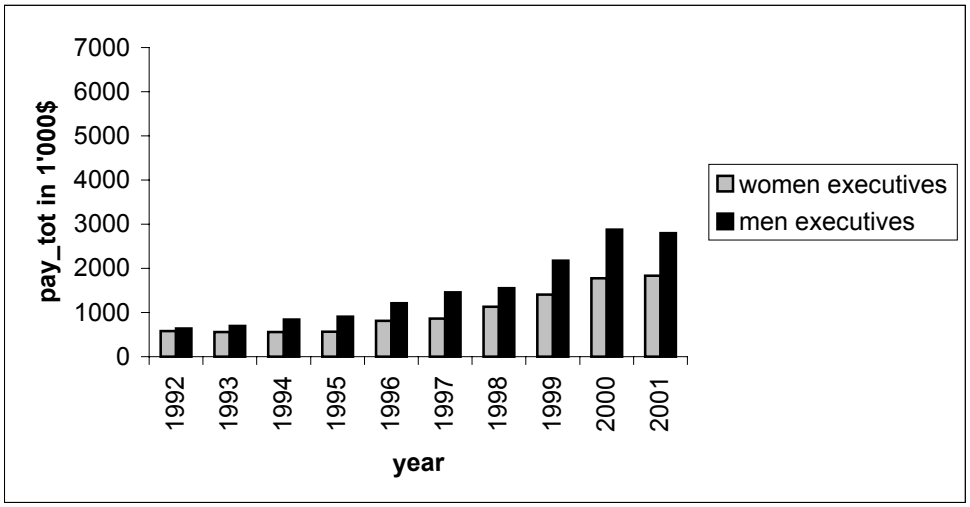
Source: Compustat Executive Compensation database 1992-2001.

Figure 2.1: Total pay of CEOs by gender over the years



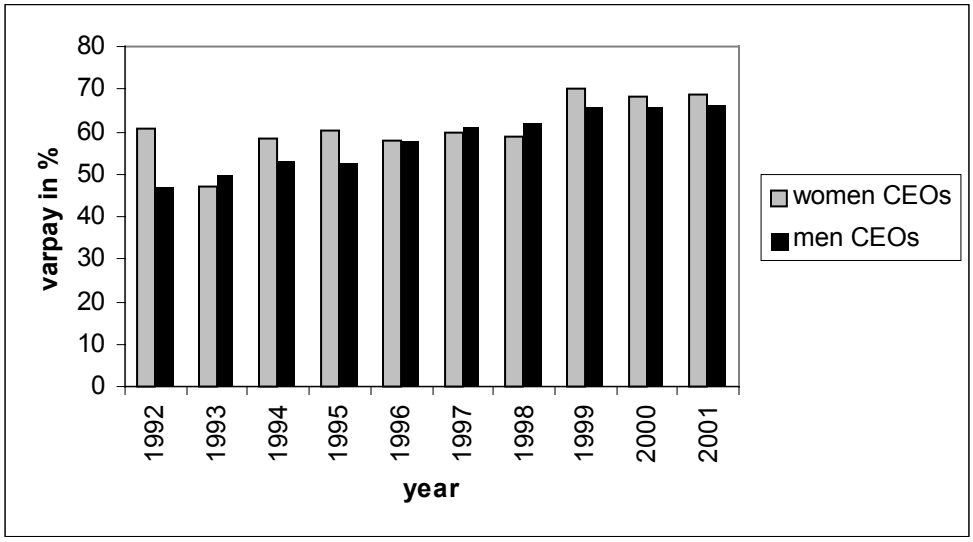
Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index. The sample includes those executives who are CEO in a current year. *Pay_tot* is the sum of salary, bonus, options and other.

Figure 2.2: Total pay of all executives by gender over the years



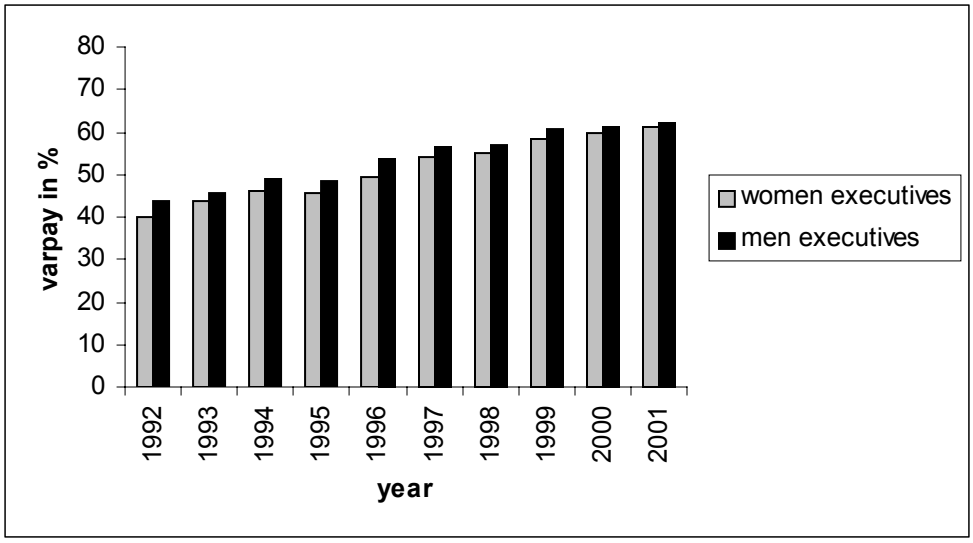
Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index. The sample includes the top five executives in a current year. *Pay_tot* is the sum of salary, bonus, options and other.

Figure 3.1: Variable compensation component of CEOs by gender over the years



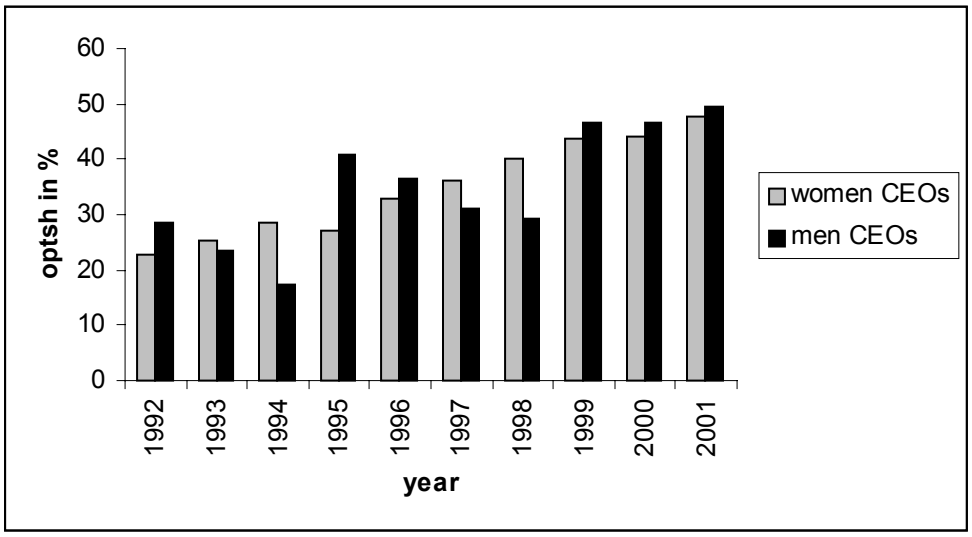
Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index. The variable *varpay* is defined as *(pay_tot-salary)/pay_tot* and expressed in %, where *pay_tot* is the sum of salary, bonus, options and other. The sample includes CEOs only in a current year.

Figure 3.2: Variable compensation component of all executives by gender over the years



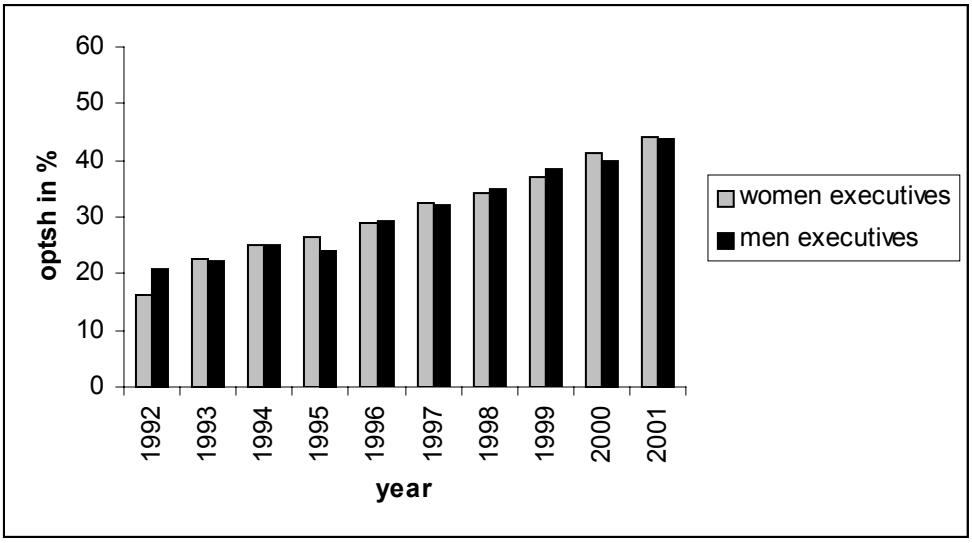
Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index. The variable *varpay* is defined as *(pay_tot-salary)/pay_tot* and expressed in %, where *pay_tot* is the sum of salary, bonus, options and other. The sample includes the top five executives in a current year.

Figure 4.1: Option share of CEOs by gender over the years



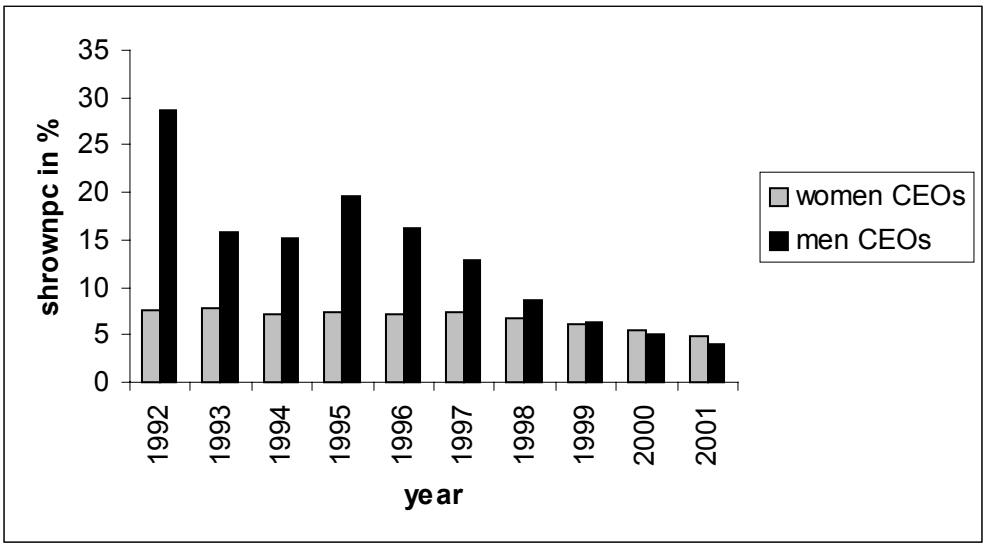
Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index. The variable *optsh* is defined as *option/pay_tot* and expressed in %, where *option* is the value of options granted in the current period and *pay_tot* is the sum of salary, bonus, options and other. The sample includes the CEOs in a current year.

Figure 4.2: Option share of all executives by gender over the years



Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index. The variable *optsh* is defined as *option/pay_tot* and expressed in %, where *option* is the value of options granted in the current period and *pay_tot* is the sum of salary, bonus, options and other. The sample includes the CEOs in a current year.

Figure 5: Shareownership of CEOs by gender over the years



Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index. The variable *shrownpc* is defined as the percentage of shares which are owned by the current CEO.

Tables

Table 1: Women by executive category

	CEO	all executives
all (% of all)	14'387 (26.46%)	54'380 (100%)
women	167	2'052
share of women by category	1.16%	3.77%

Data source: Compustat Executive Compensation; averages over the period 1992-2001.

Table 2: The dissemination of female executives across 2-digit NAICS industries

industry description[1]	% of female CEO	% of all female executives	nb.of obs.
Agriculture, Forestry, Fishing and Hunting	0	1.57	255
Mining, Oil, Construction	0	1.85	3'346
Utilities	0.56	3.83	3'500
Manufacturing of Food, Tobacco and Textile Manufacturing	3.78	4.73	2'619
Manufacturing of Chemicals, Concrete, Wood, Metal and Transportation Equipm.	1.18	2.80	18'888
Wholesale and Retail Trade	2.11	6.27	5'547
Transportation and Warehousing	0	2.50	1'523
Information	2.14	5.81	4'513
Finance and Insurance	0.19	3.42	7'905
Personal and Business Services	0.77	4.51	5'008
Health Care and Social Assistance	1.87	4.70	1'000
Miscellaneous	0	3.26	276

Data sources: Compustat Executive Compensation and http://www.census.gov/epcd/www/naics.html.

[1] The industries are originally classified according to the North American Industry Classification NAICS.

Table 3: Firm characteristics and female executives

firm characteristic	variable	all CEOs	female CEOs	male CEOs	p-value	all executive	female executives	male executives	p-value
size	employees	15.54	8.06	15.63	0.000	15.19	15.95	15.16	0.504
	(*empl)*	(44.54)	(13.80)	(44.77)		(43.65)	(51.78)	(43.30)	
	sales	3'127.82	1'779.62	3'143.60	0.007	3'151.05	2'644.67	3'170.91	0.000
	(*sales)*	(9'316.01)	(6'401.64)	(9'343.75)		(9'298.56)	(5'944.62)	(9'405.21)	
	market value	4'612.83	2'420.04	4'638.81	0.003	4'783.93	4'130.88	4'809.48	0.042
	(*mktval)*	(17'981.22)	(9'397.74)	(18'057.08)		(19'060.17)	(14'461.13)	(19'217.40)	
physical capital intensity	fixed assets/	263.89	122.62	265.68	0.000	280.58	216.98	282.89	0.000
	employees(*fix_empl)*	(762.10)	(264.27)	(766.17)		(812.85)	(614.72)	(819.61)	
	fixed assets/	57.34	41.98	57.53	0.000	57.09	51.13	57.33	0.000
	total assets (*fix)*	(40.87)	(31.65)	40.93()		(40.79)	(35.78)	(40.96)	
uniqueness	R&D expenses/sales (*rd_int)*	23.03	5.84	23.29	0.000	22.50	20.89	22.57	0.752
		(339.65)	(9.54)	(342.20)		(340.90)	(154.94)	(346.34)	
	advertising exp./sales (*adv_int)*	5.34	5.26	5.34	0.943	6.31	4.22	6.42	0.001
		(52.94)	(5.41)	(53.52)		(68.59)	(4.48)	(70.50)	
profitability	EBIT/assets	13.03	14.61	13.01	0.063	12.66	13.21	12.63	0.084
	(*profit_ta)*	(12.95)	(10.88)	(12.97)		(13.15)	(14.78)	(13.08)	
	return on equity	10.96	17.86	10.88	0.699	12.20	17.09	12.01	0.459
	(roe)	(503.72)	(225.47)	(506.08)		(498.10)	(293.90)	(504.43)	
growth	q-ratio	2.15	2.86	2.14	0.261	2.13	2.42	2.12	0.000
	(q)	(2.62)	(8.25)	(2.48)		(2.67)	(3.22)	(2.64)	
	change in total assets	60.67	45.65	60.85	0.668	53.31	30.66	54.20	0.133
	(*chg_assets)*	(3'737.53)	(203.56)	(3'759.6)		(3'329.54)	(217.41)	(3'393.81)	
risk exposure	long-term debt/total assets	19.13	12.63	19.21	0.000	19.54	17.99	19.60	0.000
	(*debtr_lg)*	(17.73)	(16.17)	(17.73)		(18.18)	(18.01)	(18.18)	
	volatility of stock	0.40	0.48	0.39	0.000	0.41	0.45	0.41	0.000
	returns (*bs_volat)*	(0.20)	(0.25)	(0.20)		(0.21)	(0.24)	(0.24)	

Data source: Compustat Executive Compensation; means over the years 1992 to 2001. The absolute values are in mio. of 2001 $, except employees, which is in thousands.
All the ratios are in %. Standard deviation in brackets. ; p-val. refers to the difference in sample means between males and females within each category (two-sided means difference test with unequal variance). The *q*-ratio is similar to Tobin's q and defined as follows: total assets plus the difference between market value and book value of equity over total assets. Sample sizes for CEOs in order all, female, male: *empl*: 13'909, 165, 13'744; *sales:* 14'349, 166, 14'183; *mktval:* 14'174, 166, 14'008; *fix_empl*: 12'791, 160, 12'631; *fix*: 13'022, 161, 12'861; *rd_int*: 6'928, 103, 6'825; *adv_int*: 3'158, 69, 3'089; *profit_ta*: 14'081, 166, 13'915; *roe*: 14'345, 166, 14'179; *q*: 14'118, 166, 13'952; *chg_assets*: 14'227, 167, 14'060; *debtr_lg*: 14'267, 167, 14'100; *bs_volat*: 13'087, 149, 12'938. Sample sizes for all executives in order all, female, male: *empl*: 52'608, 1'986, 50'622; *sales:* 54'257, 2'047, 52'210; *mktval:* 53'623, 2'019, 51'604; *fix_empl*: 48'151, 1'833, 46'318; *fix*: 48'997, 1'871, 47'126; *rd_int*: 26'028, 1'014, 25'014; *adv_int*: 12'058, 645, 11'413; *profit_ta*: 53'211, 2'024, 51'187; *roe*: 54'251, 2'048, 52'203; *q*: 53'374, 2'007, 51'367; *chg_assets*: 53'807, 2'027, 51'780; *debtr_lg*: 53'926, 1'865, 37'794; *bs_volat*: 49'116, 1'819, 47'297.

Table 4: Logit estimation female executives and firm characteristics

1+fem_exe	(1)	(2)	(3)	(4)
mtkval	-0.35**	-0.29**	-0.59**	-0.59**
	(0.09)	(0.09)	(0.13)	(0.14)
fix	0.002	0.17*	0.10	0.01
	(0.062)	(0.07)	(0.09)	(0.09)
rd_int	-0.01	-0.01	-	-
	(0.004)	(0.004)		
adv_int	-	-	-0.14**	-0.13**
			(0.03)	(0.03)
profit_ta	0.11	0.29(*)	0.41*	0.43(*)
	(0.14)	(0.16)	(0.18)	(0.23)
q	0.02**	0.04**	-0.01	0.002
	(0.004)	(0.01)	(0.01)	(0.009)
debtr_lgt	0.14	-	-0.78**	-
	(0.11)		(0.13)	
bs_volat	-	0.65**	-	-0.08
		(0.09)		(0.17)
constant	-3.38**	-3.84**	-3.37**	-3.46**
	(0.17)	(0.178)	(0.20)	(0.22)
% correctly predicted	15	15	21	21
Log/Likelihood Value	-9'931.19	-9'090.55	-5'532.84	-5'004.34
Pseudo R^2	0.06	0.07	0.08	0.08
N	25'188	23'327	11'772	10'766

Data source: Compustat Executive Compensation database over the years 1992 to 2001. The data are in $ of 2001; *mktval*, is expressed in mio x 10^{-5} of 2001$. Robust standard errors in brackets. Definition of variables: The dependent variable is the response probability P(*1+fem_exe*=1|*x*), where *1+fem_exe* is equal to one if there is at least one woman among the five top executives in a given year, and zero else; *mktval*=market value of equity; *fix*= fixed assets/total assets; *rd_int*=research and development expenses over total sales; *adv_int*=advertising expenses over total sales; *profit_ta*= EBIT/total assets; *q*= total assets plus the difference between market value and book value of equity over total assets; *debtr_lgt*=long-term debt over total assets; *bs_volat*= volatility of stock returns. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with **, *, and (*) respectively. Time and industry dummies included.

Table 5: Executive compensation components by gender

	variable	all				female				male				p-val.
		mean	sd	min	max	mean	sd	min	max	mean	sd	min	max	
CEO	salary	455.80	289.32	0	3'961.17	498.85	474.75	50.71	2’705.60	455.29	286.42	0	3'961.17	0.24
	bonus	485.79	1'375.37	0	90'375.23	347.39	644.18	0	5'523.60	487.41	1'381.59	0	90'375.23	0.01
	options	2’030.95	9’966.11	0	583’837.80	2’570.27	6’830.07	0	57’460.61	2’024.62	9’997.09	0	583’837.8	0.31
	other	36.17	345.81	0	32’970.45	35.82	121.90	0	905.60	36.17	347.58	0	32’970.45	0.97
	pay_tot	3’008.71	10’320.82	0	583’837.80	3’452.33	7’474.74	143.10	65’777.92	3’003.50	10’349.68	0	583’837.80	0.44
N		14’387				167				14’220				
all exec	salary	320.36	224.36	0	3’961.17	268.68	205.59	0	2’705.60	322.39	224.82	0	3’961.17	0.00
	bonus	297.11	1’065.74	0	121’271.30	172.85	295.68	0	5’523.60	301.99	1’084.56	0	121’271.30	0.00
	options	1’099.21	5’789.93	0	583’838.80	848.15	2’762.61	0	57’460.61	1’109.05	5’876.75	0	583’837.80	0.00
	other	20.53	214.19	0	32’970.45	10.32	56.61	0	1’348.47	20.93	218.05	0	32’970.45	0.00
	pay_tot	1’737.21	6’092.93	0	583’837.80	1’299.96	2’994.30	0	65’777.92	1’754.35	6’182.27	0	583’837.80	0.00
N		54’380				2’052				52’328				

Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index. All executives include the top five highest paid executives in each firm in the database. Variables: *salary*=dollar value of cash and non-cash salary; *bonus*=dollar value of cash and non-cash bonus; *options*=dollar value of options granted in the current period as valued using S&P’s Black Scholes methodology; *other*=dollar value of annual compensation not categorized as salary or bonus; *pay_tot*=the sum of salary, bonus, options and other; p-val. refers to the difference in sample means between males and females within each row (two-sided means difference test with unequal variance).

Table 6: Gender effect in compensation

log(*pay_tot*)	CEOs	all executives
fem	-0.22* (0.11)	-0.44** (0.04)
age	0.01** (0.002)	0.02** (0.001)
mktval	0.02** (0.002)	0.01** (0.001)
roe	0.0002* (0.00)	0.0002 (0.00)
constant	5.70** (0.11)	5.32** (0.07)
F	119.05**	148.97**
R^2	0.25	0.19
N	9'296	20'071

Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index, except market value, which is in bio. of $; *pay_tot* is the sum of salary, bonus, options and other; *fem*=1 if executive is a woman; *age*=age of executive, *mktval*=market value of equity ; *roe*=return on equity. Robust standard errors in brackets. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with **, *, and $^{(*)}$ respectively. Time and industry dummies included.

Table 7: Shareownership of CEOs by gender

shrownpc	CEOs
fem	2.55* (1.18)
mktval	0.02$^{(*)}$ (0.01)
bs_volat	-0.56 (0.60)
constant	7.27** (0.68)
F	16.24**
R^2	0.06
N	5'979

Source: Compustat Executive Compensation database 1992-2001. All data are reported in real 2001 thousands of dollars adjusted using the consumer price index, except market value, which is in bio. of $; *shrownpc* is the % of shares owned by the CEO; *fem*=1 if executive is a woman and zero else; *mktval*=market value of equity; *bs_volat*=volatility of stock returns. Robust standard errors in brackets. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with **, *, and $^{(*)}$ respectively. Time and industry dummies included.